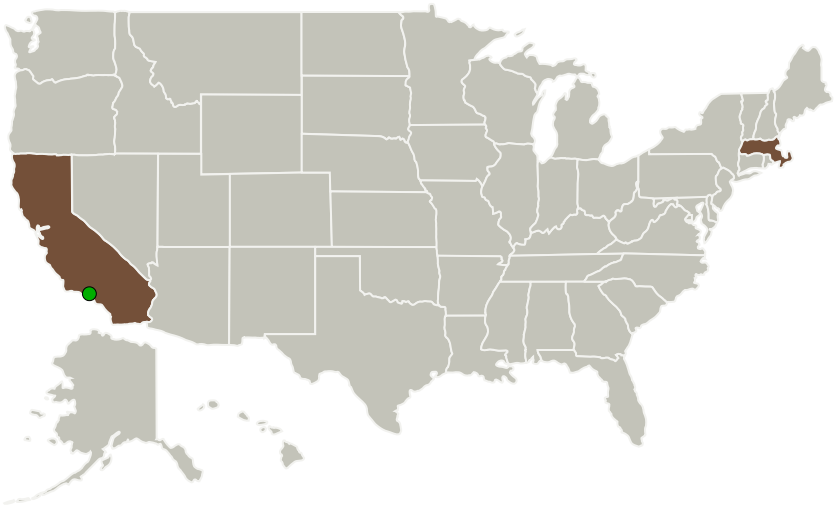
Optical Precision Deployment Latch, Phase I

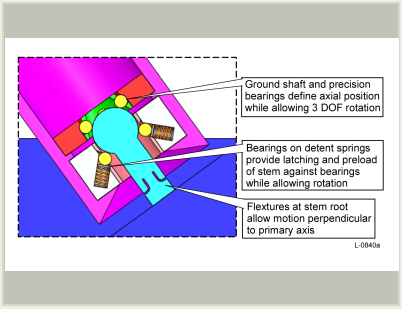
Completed Technology Project (2014 - 2014)

Project Introduction

Virtually all optical information gathering instruments benefit from greater aperture. For space-based instruments whose geometries are constrained by the launch vehicle, increasing the aperture requires deployment of some aspect of the optical train and then the precise and dynamically stable latching of the deployed components into defined positions. Existing latching technology is too inaccurate, unstable, and expensive for use in many NASA missions. Physical Sciences Inc. (PSI) will develop a simple, scalable latching technology by applying precision engineering approaches from previous developments that carefully manages the friction and strain energy stored internal to the latching mechanism. The result will be a small, low-cost latching system with sub-micron positional repeatability and dynamic stability. During the Phase I efforts, the PSI team will design, build, and test a latch for a cubesat-scale application. In future phases, PSI will fully qualify the device and demonstrate its performance when integrated into a complete deployable optical system

Primary U.S. Work Locations and Key Partners





Optical Precision Deployment Latch Project Image

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Organizations Performing Work	Role	Type	Location
Physical Sciences, Inc.	Lead Organization	Industry	Andover, Massachusetts
Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations	
California	Massachusetts

Project Transitions

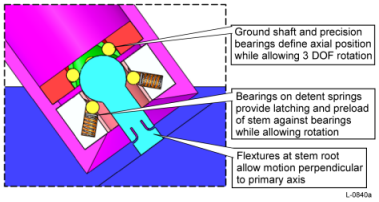
June 2014: Project Start

December 2014: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140584)*

Images



Project Image
Optical Precision Deployment Latch Project Image
(https://techport.nasa.gov/image/133071)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Physical Sciences, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Peter A Warren

Co-Investigator:
Peter A Warren

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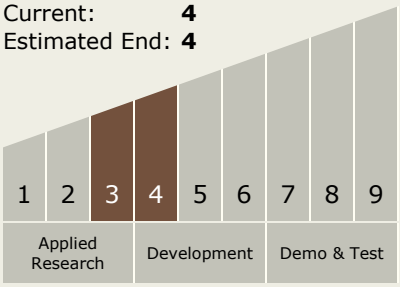
Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.3 Mechanical Systems
    - TX12.3.8 Docking and Berthing Mechanisms and Fixtures

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System